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EX PARTE OR LATE FILED

July 22, 1996

Ex Parte

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

Re: CC Docket No. 96-112 (Allocation of Costs Associated with Local Exchange Carrier Provision of Video Programming Services)

Dear Mr. Caton:

In accordance with Commission rules, please be advised that on Friday, July 19, 1996, Steve Dimmitt, Al Porta and the undersigned, representing SBC Communications Inc., met with Commissioner James H. Quello, James R. Coltharp, Special Assistant to Commissioner Quello and Lauren J. Belvin, Senior Legal Advisor to Commissioner Quello, regarding the proceeding listed above. Attached is a copy of the material that was provided at the meeting.

Due to the press of business, we are filing this ex parte today. Please call me if you have any questions.

Sincerely,

Attachments

cc: Commissioner Quello (w/attachments)
Mr. Coltharp (w/attachments)
Ms. Belvin (w/attachments)

OPEN VIDEO SYSTEM -- COST ALLOCATION

- Broadband facilities enable provision of services and benefits other than OVS. Entertainment video is only one "piece of the puzzle" in decisions to deploy broadband.
  - ISDN, Internet, work at home services, common carriage video, etc. are regulated services that demand significant bandwidth.
  - Customers receive more reliable telephone service with broadband.
  - New regulated services, cost savings, and video all impact the timing of broadband deployment.
  - Eventually broadband facilities will be needed just to provide regulated services.
- Integrated networks are more cost effective than separate standalone telephone and video networks.
- Proposed fixed 50/50 allocation of loop (and other) common costs will disincent video deployment.
  - Creates a competitive cost disadvantage.
  - Will delay video deployment.
  - Will delay deployment of regulated broadband services.
- No economic rationalization exists for 50/50 allocation proposal.
  - It is an inherently arbitrary technique
- Existing Part 64 allocation rules already address common network costs and can accommodate geographic and demographic differences.
- SWBT (and most LECs) support a per loop allocation of common costs.
  - Increasing working loops (driven by telephone or cable customer demand) does create additional loop investment and costs, i.e. indirect cost causation exists.
  - Allocation of common costs to video would be determined by: video loops ÷ (video + telephone loops).
  - Each loop receives the same common overhead i.e. <u>equitable sharing</u>.
- Consistency in regulation of competitors: cable companies upgrading to provide telephone service should live by the same cost allocation rules as telephone companies.
- The proposed exogenous changes to price caps are unfair and inappropriate.
  - One-sided: network upgrades are <u>not</u> included in PCI.
  - Few, if any, video common costs are presently in system.
  - Efficiencies will be reflected in price cap productivity factor.
  - Efficiencies will be reflected in productivity savings and passed on to consumer in the competitive access/local exchange market place.

Traffic is making a mess of the Internet. But that doesn't necessarily doom the electronic future. With dozens of companies racing to ease or dodge tie-ups, who knows? One day you may even enjoy using this thing.

Waiting to Download

by Alison L. Sprout

You're lounging on the sofa in the den, remote control in hand. That familiar thwickety-thwack bass riff signals a commercial break in *Seinfeld*, and another of those unbearable battery ads takes over your TV. Anything would be better than this junk, so you punch in channel 41 to check out the biography of Jimmy Stewart on A&E. The picture goes gray, a tiny hourglass icon appears, and a message scrolls across the bottom of the screen: "Connect: Host A&E contacted. Waiting for reply ..." You wait. And wait.

Oh, well. So you pick up *Smithsonian* magazine from the coffee table. You flip to page 20 for a look at the article about inventors, and what do you find? Blank paper. Thirty seconds later, words and images trickle into view, only to stall in mid- ...

What's wrong with this picture? Talk about an ungratifying experience. Yet for millions of people this is often what it's like to use the Internet, that incredible electronic medium that's supposed to be the biggest thing since the printing press.

Binary billionaires and pundits tell us that the Internet is the digital plumbing everyone's been waiting for. It will open the way to true electronic commerce, vivid interactive entertainment, and an efficient wired workplace. By the turn of the century, they predict, our very economy will rely on this paradigm-busting virtual world. Dozens of industries and hundreds of businesses are collectively wagering billions of dollars on the assumption that the Internet will be everything its proponents say.

Yet there's one little hangup—the Internet often doesn't work the way it's supposed to.

More like a Rube Goldberg contraption than a well-run municipal waterworks, the Internet is bedeviled by bottlenecks—the electronic equivalent of mismatched pipes, underpowered pumping stations, and leaks. The result: a balky system that too often displays that irritating hourglass on your monitor rather than anything useful or engaging. Consider what happens when you click on a Web link with your mouse. This electronic request for information must navigate a treacherous route through your modem, over local and long-distance phone lines, through different devices that push it along, to the computer where the Web page is stored. Then the digital packets that make up that page must find their own routes back to you.

Worse yet, traffic is now flooding the Net. Longtime users complain of "brownouts" and yearn for the good old days when the Internet was a private thoroughfare for academics. In some key parts of the Internet, 10% to 20% of all messages sent get lost. Even though the Internet has yet to go fully mainstream, some experts are predicting its imminent collapse, or at least its decline into the virtual equivalent of a clogged drainpipe. *continued*

Illustration by Gordon Studer

For the past eight months Bob Metcalfe, the inventor of Ethernet, a technology integral to both the Internet and many private corporate networks, has been preaching doom from his bully pulpit as a columnist at the trade magazine *InfoWorld*. Says he: "The Internet has outgrown what it was designed to do. It has become a house of cards."

Technology is supposed to triumphantly surmount all obstacles in its path, not buckle under heavy usage. For decades semiconductor performance has doubled every 18 months. If today's videogame player has better graphics than yesterday's mainframe, why is the 27-year-old Internet bogging down?

Part of the problem is the piecemeal way this monster was assembled. The Internet started out in 1969 as an experiment to build a national-security computer network capable of surviving nuclear attack. To accomplish this, computer scientists devised a way for computers to exchange data via a large number of possible paths.

The designers made this work by segmenting the information being sent—say a program or a document or a table of numbers—into tiny "packets." Think of these as electronic envelopes containing part of a photograph or a few pages of text. Besides holding data, each packet is labeled with its destination, a return address, and an ID number. At the heart of the network are specialized devices called routers that read a packet's address and move it closer to the computer it's supposed to reach. If part of the network got annihilated by bombs, the rest would still function.

This packet-switching system has the virtue of being practically indestructible. It has scaled up handily from hundreds of "nodes" in the Seventies to the globe-girding system that now links tens of millions of computers.

But the system was not designed to be fast or efficient with so many users. Clearing up its congestion is no simple matter. Says Andy Grove, CEO of Intel: "The sobering truth about the emerging networked world is that the very thing that is bogging us down is what we most want, namely bandwidth."

Ah, bandwidth. That techie buzzword denotes the capacity of a telecommunications medium to convey data. If networks are like waterworks, bandwidth is a function of three elements: the size of the pipes—the wires, cables, and fiber-optic lines that carry data between computers; the speed of the pumps—namely routers and switches that direct data from pipe to pipe; and the responsiveness of the reservoirs—corporate computers and Web servers that store and fish up the information people want to see.

Logjams happen all along the line. Many involve the pipes themselves, starting with the mundane copper telephone wire to which your PC modem at home connects. The fastest modems sold with most systems cost around $200 and send and receive information at 28.8 kilobits per second. That's roughly the equivalent of getting *Alice's Adventures in Wonderland* in six seconds. Sounds fast, but downloading a Web page full of graphics by modem can feel like waiting for a stoplight to change.

Moreover, local phone systems, many of which date from the Sputnik era, were designed to juggle scads of voice calls averaging a few minutes in duration. Online customers, however, often stay on for hours. That can tie up the connections in a local switching center. (Telltale sign: a rapid busy signal when you try to make a call.) Internet service providers—companies that offer dial-up Internet access in exchange for a monthly fee—likewise get overwhelmed if too many customers try to connect at the same time. Says Steve Franco, an analyst who follows ISPs for the Yankee Group in Boston: "With some providers you'll get a busy signal 30% of the time you call in."

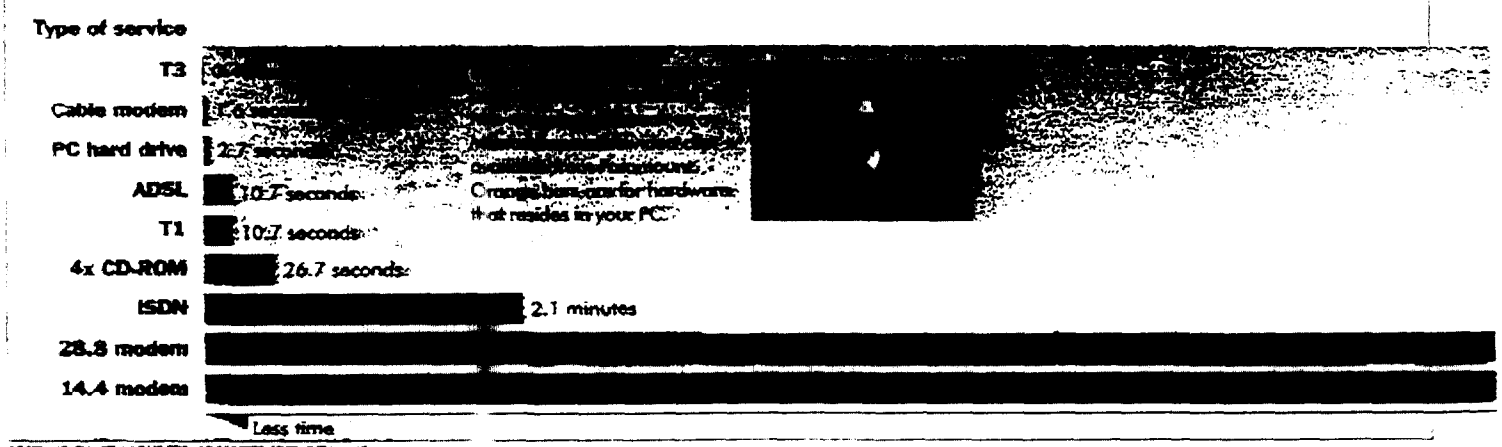
If your employer has a well-managed internal network, you probably find things work better at the office. Many companies use T1 lines, advanced coaxial-cable or fiber-optic cir-

REPORTER ASSOCIATE *Sheree R. Curry*

How Fast Is Your Connection?

■ Getting information—that's the simple goal of anyone who surfs the Net. Yet as the table below shows, Web surfers using modems extract data from the Net far more slowly than they do from their PC's CD-ROM or hard drive. Some opt for an ISDN line, which is a big step up. But home delivery won't get really speedy until cable modems or a phone technology called ADSL takes hold.

For now, your best bet is to log on from work. Forget about T3 lines; they're mostly used by ISPs to deliver data. But the T1 line hooked into many corporate networks is designed to deliver information up to 104 times faster than a dinky 14.4 modem.



FORTUNE CHART / SOURCES: FORRESTER RESEARCH, ANS

cuits designed to retrieve data at up to 50 times the speed of a 28.8 kbps modem. Still, corporate networks hooked into T1s can get flooded—particularly if too many employees simultaneously try downloading the digital video clips that are now trendy on the Web.

That's the story close to home, and it's bad enough. But what's really frustrating about the Net is that so many of the problems that hang you up occur far outside your reach. At least you think you can fix that software bug on your PC. Once you venture beyond your modem or company network, you throw yourself on the mercy of thousands of companies whose equipment makes up the Internet.

Some of the largest phone companies support the Internet's backbone, the digital equivalent of Rome's great aqueducts. Pacific Bell, Ameritech, Sprint, and MFS Communications operate so-called network access points linking all the biggest pipes of the Net. Over MCI's portion of the backbone, information flows at a torrential 155 megabits per second—100 times the speed of a T1.

Unfortunately, the packet sent from your PC requesting a World Wide Web page doesn't just flow smoothly through one pipe en route to its destination. Even as it traverses the most developed portions of the Net, your message has to wend its way through pipes of different sizes, and through the pumping stations called routers, which are mostly made by Cisco Systems and operated by the telcos and ISPs. A router looks at each packet of information and passes it along to another router that helps it toward its destination, after determining the best path available at that moment. That means bypassing any routers that might be on the fritz or backed up.

A router makes such judgments by consulting the equivalent of a telephone directory stored in its memory, which lists addresses of other routers around the net. As more routers are added (there are now at least 40,000 on the Internet), the directories must be updated and expanded. This can slow processing, especially with "transit routers," which pump data along the Net's backbone. Each transit router keeps a giant international master list of every functioning router on the Net. When trouble comes, such as when equipment failure shuts down part of the Net, the transit routers must update their lists immediately—a processing task so demanding that it can tie up the machines, compounding the traffic delays.

Ultimately, if you're lucky, your request reaches the "reservoir" containing the Web page you want. But there's no guarantee the reservoir is anything more than a puddle. It could turn out to be a Website operated by some college kid in Kenosha who stores information on a hand-me-down 486 PC that dribbles out data over an obsolete 14.4 kbps modem. What's worse, there are 37 other requests waiting in line to download the same page. Now, that's a bottleneck.

If this really were a waterworks, you'd be calling the plumber. Problem is, no single plumber will do. On the Net, a solution in one place (the kid in Kenosha gets a Pentium with a 28.8 modem for Christmas) can shift the bottleneck somewhere else (now that people can actually get stuff off his site, the de-

9.3 minutes

Tweaking Your Navigator

■ Using the Net at work can be frustrating—but dialing in from home, via an ordinary phone line and a 28.8 modem? Forget it! That's not Web surfing—that's Web crawling.

We've found a couple of quick steps you can take to reduce your suffering.

First, make sure you're working with a good Internet service provider. Call up yours, find a service rep who seems knowledgeable, and ask one key question: Does this ISP have a direct connection to a backbone Internet service? If the answer is no, change providers.

Second, if you're using the Netscape Navigator browser—85% of Web surfers do—you can tweak its performance considerably by changing a few settings. FORTUNE asked Netscape's Tom Tsao for advice on how to get the most out of the browser.

Navigator has a built-in way to improve performance—it stores (or caches) on your hard drive the Web pages you've viewed most recently. You can adjust this function so that your system accesses Web pages more quickly and efficiently, especially if you have a Pentium PC that's not cluttered up with lots of other applications. Even if you're a serious computerphobe, this is one software fix that's easy to make.

First, open up Navigator (we're using the 2.02 version for PCs). At the very top you'll see a menu item called Options. Click on that, and then on Network Preferences. This opens a page with three tabs across the top—click on the one labeled Cache, and you've arrived.

You'll see two boxes, one titled Memory Cache, the other Disk Cache. Memory Cache stores the Web pages you've accessed most recently in such a way that they're easy to open up again quickly. Once Memory Cache is full, Web pages get stored in Disk Cache, which resides on your PC's hard drive. If that fills up, Navigator trashes the oldest files.

Navigator lets you change the amount of memory allotted to each cache. Don't just load up—setting aside too much memory for Web pages can make other programs run slowly or even crash. Here are the settings Tsao recommends:

▶ If you have an older PC with four megabytes of RAM and 12 megs of hard-disk space free, set memory cache at zero and disk cache at 3,000 kilobytes.

▶ With a PC that has eight megs of RAM and 500 megs of free hard-disk space, set memory cache between zero and 1,000 and disk cache at 5,000.

▶ For power users, with 16 megs or more of RAM and a one-gigabyte hard disk, set memory cache at 2,000 to 3,000 and disk cache between 5,000 and 10,000.

On the same screen you'll see the heading Verify Documents with three buttons beside it. "Once per Session" is the most efficient setting for normal Web surfing.

You'll also find buttons labeled Clear Memory Cache Now and Clear Disk Cache Now. These erase the pages your software has automatically stored. They're a useful option if, say, after weeks of cruising only sports Websites, you suddenly find yourself interested in gardening. Clear the caches of accumulated sports junk, and suddenly you've got loads of memory available. It's a way to make browsing Web pages on bougainvillea more fun than watching grass grow.

More time ▶

mand swamps the local Internet service provider). For the Net to truly change, it will have to be upgraded on many different fronts.

Luckily, a multitude of companies believe that any collapse of the Internet would seriously damage future revenue streams. These companies include America Online, which can sustain a critical mass of consumers only if the Net becomes almost as easy to use as television; Cisco Systems and Bay Networks, which stand to earn millions by selling routers and switches that will make the Net faster for companies connecting their own networks and reaching out to suppliers; and MCI and US West, which see high-speed, reliable Internet access as part of the bundles of telecom services they want to sell consumers. These competitors are beefing up the infrastructure in an effort to dodge today's traffic problems, as well as investing in new technologies that may make the Net robust enough to support new businesses tomorrow.

America Online, for example, has purchased many "proxy servers," computers that sit in AOL's own network and hold facsimiles of the Web pages most often requested by customers. This so-called data caching helps AOL deliver better service. Subscribers get to see these pages much more quickly than if they had to catch a wave all the way across the Internet. As with so many of today's investments, AOL's also happens to benefit the Net as a whole. By keeping subscribers within one network, the proxy servers alleviate some of the congestion that clogs the Internet. "If we didn't take this approach," says CEO Steve Case, "Websites might be brought to their knees by the sudden influx of [our] traffic."

The telephone companies have an alphabet soup of technologies aimed at turbocharging phone lines. One result of that effort is faster Internet service for those who can afford it. ISDN (integrated services digital network), for example, has been marketed in limited ways by Baby Bells for over a decade. But it caught on only when it became popular with techies hungry for speedy home Internet service. An ISDN modem delivers data five times as fast as a standard modem (see chart). But ISDN is still hard to get, difficult to install, and expensive.

US West, GTE, and Bell Atlantic are experimenting with a similar technology, called asymmetric digital subscriber line, that promises Net surfers download speeds comparable to those of T1 lines. There's a hitch, though: ADSL conveys data back from your PC to the Internet at a much slower rate. That probably makes ADSL an interim fix—futuristic applications like videoconferencing from your PC to your grandchildren's PC may require equal bandwidth in each direction.

Like the phone companies, cable outfits believe the biggest future profits lie in selling customers a wide array of premium services. The cable companies hope to cash in on a big bandwidth advantage: The lines they use to deliver TV to the home are far more capacious than telephone wires. By introducing a new breed of modem that will let homeowners use those lines to download data at more than 300 times the speed of a 28.8 kbps modem, ComCast, TCI, and Time Warner (parent of FORTUNE's publisher) all plan to jump into the Internet game in a few areas this year. Most services will charge between $15 and $45 per month for unlimited use; that fee should include the cost of leasing cable modems built by General Instrument, Hewlett-Packard, or Motorola. But early cable PC services will have drawbacks: they won't be available everywhere, since, according to a report by Forrester Research in Cambridge, Massachusetts, only about 20% of existing cable networks can handle two-way transmission. Those that do will upload data from your PC at a much slower speed than they download from the Internet.

"People need to start paying for what they consume. If they don't, there will be no economic incentive to keep building."

Another promising technology would dispense with wires altogether. Hughes Electronics, purveyor of the hot-selling DirecTV satellite video service, now offers an Internet service called DirecPC. It relies on a two-foot satellite dish (not the same one you use for TV) to pull in data at ten times 28.8 kbps modem speed. DirecPC is expensive—more than $1,000 for the dish, software, and installation, plus up to $40 a month in service charges. You also must pay for a standard Internet account, so you can request Web pages and send E-mail over the phone lines—DirecPC data flow just one way, from the satellite, not to it. But Motorola and other companies are exploring ways to retrofit their satellite systems to support two-way Internet access. And in the next ten years, Craig McCaw's $9 billion, 840-satellite Teledesic project may spread two-way, high-speed Internet access around the world.

These technologies do little to help corporations that have opted for the Internet as the way to connect to important customers and tie together far-flung offices. The public Internet offers them a way to avoid the expense of leasing dedicated lines from telephone companies. "By the turn of the century, the public Internet will usurp the private corporate data network," says Tom Pincince, an analyst at Forrester. But even if valuable corporate data are safely encrypted, sending information via the Internet's myriad routers can be unnervingly slow and unreliable. Corporations are looking for Internet service providers that can guarantee fast and efficient service.

That's why the biggest Internet providers—like MCI, UUNet, and ANS—are spending to bump up the performance of their sections of the Net. For starters, they are snapping up specialized digital switches that let messages leapfrog intermediary Internet routers. (Demand for switches has set off a free-for-all among suppliers like Cisco Systems, Cascade Communications, and 3Com.) They are also allying with one another, closely linking their networks to speed customers' traffic by allowing it to bypass small providers.

To earn adequate returns on the added bandwidth, MCI and others are likely to charge more for certain services. "People need to start paying for what they consume, because if they don't, there will be no economic incentive to keep building the infrastructure," says Vinton Cerf, a founding father of the Internet who is now a senior vice president at MCI. Users willing to pay more will get premium services such as guaranteed, secure on-time delivery. If you don't have that kind of money, don't worry—basic service at cheap rates will still be available from both megaproviders, like Sprint, MCI, and AT&T, and smaller local outfits.

Of course, the Internet that will emerge from all these changes—different customers paying different fees for different levels of service—is hardly the egalitarian Net envisioned by longtime users, who cherish its sense of community. But these alterations are crucial steps toward electronic commerce, interactive TV, and other innovations that will help jazz up life in the 21st century. ■